LISTING OF CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in this application:

Claims 1-49: Canceled.

50. (Original) A method for locating an ectopic beat during pace-mapping with a roving catheter, comprising the steps of:

(a) eliciting at least first and second paced signals from respective first and second locations of the roving catheter;

(b) using a correlation coefficient calculation on the elicited first and second paced signals to identify a best fit between a reference template and each of the first and second paced signals; and

(c) simultaneously displaying on a display the best fit for each of the first and second paced signals.

51. (Original) The method of claim 50, whereas the reference template comprises a waveform segment of a single heart signal which includes an arrhythmic component.

52. (Original) The method of claim 51, further comprising the step of displaying the reference template on the display while the first and second paced signals are being displayed.

53. (Original) The method of claim 50, including the additional step of displaying a quantitative indicator of each correlation coefficient calculation on the display.

54. (Original) The method of claim 50, wherein the data is acquired from multiple leads and wherein the quantitative indicator is a composite average of coefficients calculated from the multiple leads.

55. (Original) The method of claim 50, wherein the quantitative indicator is displayed as a graph showing percentage of fit.

56. (Original) A method for tracking ectopic beats through template matching, comprising the steps of:

(a) establishing a reference template over an interval of a first ECG signal;

(b) monitoring a data signal for a triggering event;

(c) initiating an offset period in response to the triggering event; and

(d) after the offset period has elapsed, using a correlation coefficient calculation on the data signal to identify a best fit between the reference template and the data signal over the interval.

57. (Original) The method of claim 56, wherein the triggering event is defined by the user.

58. (Original) The method of claim 56, wherein the triggering event comprises one of: a waveform property, a pacing pulse, an activation sequence ,an external timing signal, and a combination thereof.

59. (Original) The method of claim 56 wherein the data signal is acquired from a real-time data stream which includes successive triggering events, the method including the additional step of repeating steps (c) and (d) in response to each successive triggering event in the real-time data stream.

60. (Original) The method of claim 56 wherein the correlation coefficient calculation terminates upon a designated event.

61. (Original) The method of claim 60 wherein the designated event is a correlation coefficient value threshold.

62. (Original) The method of claim 56, including the additional step of processing a portion of the data signal corresponding to the identified best fit.

63. (Original) The method of claim 62, wherein the processing step comprises subtracting the reference template from the portion of the data signal corresponding to the identified best fit to define a derived waveform, the method including the additional step of displaying the derived waveform on a display.

64. (Original) The method of claim 62, wherein the processing step comprises ablating heart tissue.

65. (Original) A method for identifying multiple distinct arrhythmias comprising the steps of:

(a) acquiring a first arrhythmia signal;

(b) defining the first arrhythmia signal as a first template;

(c) acquiring a second arrhythmia signal;

(d) correlating the first template and the second arrhythmia signal;

(e) identifying the second arrhythmia signal as a second, distinct arrhythmia if the correlation fails prescribed criteria.

66. (Original) The method of claim 65, wherein greater than two arrhythmia signals are present, and comprise a set of templates, the method further comprising the steps of:

(a) defining the second, distinct arrhythmia as a second template;

(b) acquiring an additional arrhythmia signal;

(c) sequentially correlating the additional arrhythmia signal to each template in the set of templates;

(d) identifying the additional arrhythmia signal as a distinct arrhythmia signal if the correlation fails prescribed criteria;

(e) defining the additional distinct arrhythmia signal as an additional template and

repeating steps (b) - (e) until no additional arrhythmia signals remain that fail the prescribed criteria.

67. (Original) The method of claim 66, including the additional steps of:

(a) acquiring a paced signal produced by a pace mapping catheter in or adjacent to the heart;

(b) correlating the paced signal sequentially to each of the templates in the set;

(c) identifying the location of an ectopic focus when a correlation of the paced signal to one of the templates meets or exceeds prescribed criteria.

68. (Original) The method of claim 67, further comprising the step of abating the ectopic focus.

69. (Original) The method of claim 67, further comprising repeating steps (a) - (c) until the ectopic focus location of each distinct arrhythmia signal has been identified.

70 (Original) The method of claim 1 wherein the defining step comprises: defining the reference template as a set of waveform segments that are obtained from a plurality of electrocardiac leads between marked begin and end points.

71. (Original) The method of 70 wherein the begin points of the waveform segments occur at different points in time.

72. (Original) The method of 70 wherein the end points of the waveform segments occur at different points in time.

73. (Original) The method of claim 50, wherein the first paced signal is the most recent paced signal and the second paced signal is the paced signal prior to the first paced signal having the best fit.

74. (New) A method for deriving a p-wave signal from a premature atrial contraction ("PAC") beat to assist a person in diagnosing a heart, comprising the steps of:

(a) selecting a QRS-T segment of a reference ECG signal;

(b) permitting a user to mark a begin point and an end point of the selected segment of the reference ECG signal;

(c) defining a reference template as being a waveform segment between the marked begin and end points of the selected segment of the reference ECG signal;

(d) acquiring the PAC beat at the signal processing unit from multiple leads;

(e) processing the PAC beat so as to derive the p-wave signal, wherein the derived p-wave is a derived, spontaneous p-wave template;

(f) maneuvering a pace mapping catheter within or adjacent the atria while pacing the heart while repeating the acquiring and processing steps so as to derive a paced p-wave; and

(g) comparing the derived, paced p-wave to the derived, spontaneous p-wave using a correlation coefficient to identify a best fit between the derived, spontaneous p-wave template and the derived, paced p-wave.

75. (New) The method of claim 74 wherein the ECG signal is captured by a lead.

76. (New) The method of claim 75 wherein the lead is an intracardiac lead.

77. (New): A method for determining a most likely site of origin of a spontaneous P-wave comprising:

(a) defining a spontaneous P-wave as a template;

(b) maneuvering a pace mapping catheter within or adjacent the atria;

(c) pacing at a location in or adjacent the atria using a pace-mapping catheter;

(d) acquiring a paced P-wave signal from the pace-mapping catheter;

(e) comparing the spontaneous P-wave template to the paced P-wave signal; and

(f) repeating steps (b), (c), (d), and (e) until such time that the spontaneous P-wave template and the paced P-wave signal correlate with one another within a prescribed criterion.

78. (New) The method according to claims 77, wherein the paced P-wave signal is superimposed on an electrocardiac signal, the method further comprising the steps of:

(a) selecting a QRS-T segment of a reference ECG signal;

(b) permitting a user to mark a begin point and an end point of the selected segment of the reference ECG signal;

(c) defining a reference template as being a waveform between the marked

begin and end points of the selected segment of the reference ECG signal;

(d) subtracting the reference template from the electrocardiac signal having the superimposed paced P-wave signal to define a resultant derived, paced P-wave signal; and

(e) comparing the resultant derived, paced P-wave signal to the spontaneous P-wave template.

79. (New) The method of claim 77 wherein the spontaneous P-wave is a spontaneous, derived P-wave.